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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SHINGLETON, MICHAEL B	
ART UNIT	**PAPER NUMBER**
2817	

DATE MAILED: 12/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/610,933	raab	
	Examiner	Art Unit	
	Michael B. Shingleton	2817	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 November 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-64* is/are pending in the application.

4a) Of the above claim(s) *10-12,20-27 and 47-55* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9, 13-19, 28-46 and 56-64* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

MICHAEL B SHINGLETON
PRIMARY EXAMINER
GROUP ART UNIT 2817

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claims 29 and 35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 recites that the time varying input tuning signal that is applied to the control input "is independent of a signal amplified by said power amplifier", yet claim 29 says that an envelope detector is connected to the control input and is "responsive to an input RF signal". The "signal to be amplified by said power amplifier" is the input RF signal and thus claim 29 is contradictory to that of claim 1 that requires signal applied to the control input be independent".

Claim 1 recites that the time varying input tuning signal that is applied to the control input "is independent of a signal amplified by said power amplifier", yet claim 35 recites that when the output of the output network (A signal related to the signal to be amplified.) is above a threshold the electronically tunable output network is used to control the amplitude and thus the time varying tuning input signal (The signal that controls the amplitude.) is not independent of a signal amplified by the power amplifier for the output of the output network is being sensed to determine whether it is above or below a threshold used to control the electronically tunable output network. Thus claim 35 is also contradictory to claim 1 which makes the scope of the claim unclear. It can not be both independent and dependent.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-9, 13-19, 28, 30-34, 36-38, 40-46 and 56-64 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bosse et al. 3,391,347 (Bosse) in view of Clar 3,424,993 (Clar) as evidenced by Ishii 5,862,458 (Ishii).

Figure 5 and the relevant text of Bosse discloses an electronically tuned circuit that is part of the output network of an amplifier arrangement. The two electronically tunable non-motor driven solid-state elements 71 and 68, commonly called varactors, are part of the output network and are capable of being

tuned via a voltage. Transistor 50 forms a common emitter amplifier whose output is applied to the input of the output network as is clearly illustrated by Figure 5 of Bosse. In the output network there is at least one control line 8 that forms at least one control input for the electronically tunable components. The claims have been amended previously to state that the control signal varies over more than two values thus forming a time varying input signal. Note that the potentiometer 13 allows the control signal to vary over more than two values over time. In fact the potentiometer 13 allows for a continually varying signal over time. Note that because of the control that the potentiometer 13 offers the circuit, this potentiometer can be called a "controller". Applicant is just not specific on exact what structure a controller is to include and thus the examiner is only giving the broadest reasonable interpretation to the claims (See MPEP 2111). The claims have been recently amended to now recite that the time varying tuning input signal is "independent of a signal amplified by said power amplifier". This was done to overcome prior art arrangements such as Ishii that senses the output in some way to tune the output network. These structures are now excluded from the present invention that would also include the common transmitter and matching network. For these reasons the amendment necessitated this new rejection. The time varying tuning input signal from the potentiometer 13 of Bosse is clearly independent of a signal amplified by the amplifier 50. Note that there is not feedback shown to control the potentiometer in response to the sensing of the amplified output signal. The changing of the variable capacitance elements above ("electronically tunable component") changes the resonant point of the output network and thus tunes the output network to a desired frequency band. For example if the input signal to the amplifier is a UHF signal of a certain frequency in the "I" band to be transmitted, then the tuning of the output network would be selected accordingly. The only thing that Bosse is silent on in the Figure 5 embodiment with respect to that of claims like claim 1 of the instant invention is the calling of the common emitter amplifier 50 a "power amplifier" for providing "large-signal mode" signals. Since neither the claims or the specification defines how large the large-signal mode is and neither the claims or the specification defines the structure that defines a "power amplifier", given the broadest reasonable interpretation of the claims the common emitter amplifier 50 is considered a power amplifier that provides a "large-signal mode" output signal. However, alternatively, Bosse is not limiting as to the use or implementation of the invention. As is clearly presented by Clar, the common emitter amplifier is a well known power amplifier structure. Note that the common emitter power amplifier 28 is coupled to a tuned circuit composed of variable capacitance 39 and the output transformer 46 whose output is connected to an antenna for transmitting a "large-signal mode signal" to free space. In fact Clar closely parallels the arrangement of Bosse, for note that the arrangements are RF arrangements and that the two amplifiers (50 of Bosse and

28 of Clar) are common emitter amplifiers, and that the outputs of these amplifiers are applied to a tuned resonant circuit each having a transformer with a variable capacitance connected to the primary side of the transformer whose capacitance is tuned to the operating frequency (See the paragraph bridging columns 2 and 3 of Clar and column 1 around line 30 of Bosse), and also note that the secondaries of these transformers are to provide the output signal. It is just that Bosse is silent on the particular load for the secondary of the transformer in the Figure 5 embodiment and Clar notes specifically that the output of the secondary of the transformer is for an antenna so as to allow for the transmitting of an RF signal. Based on past responses by applicant, applicant might argue that a varactor cannot be used in a power amplifier arrangement. However as evidenced by a varactor 83 is well know to be used at the output of a power amplifier as part of output network 8.

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilized the amplifier arrangement of Bosse as a RF power amplifier for providing an output signal that is to be applied to an antenna for transmission because, as the reference Bosse is silent on the use of the RF amplifier 50 one of ordinary skill in the art would have been motivated to use the RF amplifier of Bosse for any art-recognized use including the art-recognized use of providing an amplifier arrangement such as Bosse or Clar for a power RF amplifier for providing a large-signal mode signal to an antenna as taught by Clar. One of ordinary skill in the art at the time the invention was made would have been further motivated to make the combination so as to allow the non-motorized control the tuned output network of the arrangement of Clar as taught by Bosse.

The tuning of the output networks above clearly is done in part to "maintain a match between the output network and a varying load impedance" or stated differently "provides a power-amplifier load-impedance locus that substantially maximizes power-amplifier efficiency" or "causes said power-amplifier load impedance to follow a substantially resistive locus, thereby maintaining power-amplifier efficiency near maximum". For example an antenna is common known to be adjustable in resonance i.e. the load impedance will change. When the antenna is changed in resonance, i.e. the load impedance is changed then the output network must be tuned to provide a match. Note that Clar specifically states that if the output network is "mistuned" then undesireable peak voltage can appear at the collector of the power amplifier possibly destroying the power amplifier. Thus clearly one would tune the varying reactance of the combination made obvious above so as to maintain a match of the output network when the load is varied such as the antenna is adjusted for a different frequency.

With respect to claims like claims 4, 34, these are very broad claims that recite only functional language and do not recite structure. Accordingly, because of the signal to the variable capacitance can

be changed over time via the use of the potentiometer or the like, the arrangement made obvious above is fully capable of modulating the output signal in the same exact manner as disclosed by applicant. As noted above Clar clearly shows that by changing the tuning of the variable capacitance the voltage magnitude of the amplifying transistor and accordingly the output signal will change. Clar clearly teaches that in such an arrangement made obvious above that the output signal is amplitude modulated with respect to the varying reactance of the electronically tunable reactive component.

With respect to claims like claims 8 and 9, the tuning inputs here are recited as being selected in accordance with a "lookup table". One well known art recognized equivalent structure to provide various control voltage potentials is by way of a look-up table. It would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the potentiometer 13 of Bosse with a look-table controlled by a computer or processor sometimes referred to a DSP or use the look-up table/DSP to control the potentiometer 13 since the examiner takes Official Notice of the equivalence of a look-table and associated computer control and the potentiometer for their use in the control circuit art and the selection of any of these known equivalents to provide a control voltage signal would be within the level of ordinary skill in the art. One of ordinary skill would have been additionally motivated to replace the potentiometer or use the potentiometer in combination with a DSP and look-up table since the DSP and look-up table allows for the automatic control i.e. it is not manual and the DSP and look-up table has the added advantage of being able to be programmed i.e. the program can changes for changes that are caused with time such as the aging of the circuit or the program can changed when there are desired changes in the circuit such as one desires a change in frequency or one of the circuit elements has to be replaced and the circuit would then be required to be recalibrated.

With respect to claims like claims 14, and 17-19 here the electronically tunable capacitor is implemented as either a transistor, a micro electro-mechanical system device, a variable-dielectric material or a piezo-electric device. These claims are clearly added merely to provide coverage for all conventionally known art-recognized equivalent electronically tunable capacitors. The electronically tunable capacitor of Bosse is that of a diode, however, Clar is silent on the exact structure of the variable capacitance element thus accordingly it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the diode of the combination made obvious by Bosse and Clar with either a transistor, a micro electro-mechanical system device, a variable-dielectric material or a piezo-electric device since the examiner takes Official Notice of the equivalence of either the transistor, a micro electro-mechanical system device, a variable-dielectric material or a piezo-electric device variable capacitance elements and diode based variable capacitance element for their use in the electronics art and

the selection of any of these known equivalents to provide a variable capacitance function would be within the level of ordinary skill in the art.

With respect to claims like claims 30 and 31 here a "drive-level adjustor" is coupled for adjusting a signal provided to the power amplifier and a processor is used to provide a drieve signal to the power amplifier. Given the broadest reasonable interpretation of the claims the potentiometer 13 of the combination made obvious does adjust the amplitude of a signal provided to the power amplifier arrangement. However, alternatively, the use of an DSP controlled attenuator at the input of a power amplifier to adjust the gain of the amplifier arrangement is very conventional and thus It would have been obvious to one of ordinary skill in the art at the time the invention was made to provided an DSP controlled attenuator at the input of the power amplifier so as to allow for gain adjustment of the amplifier as is conventionally known by those of ordinary skill in the art. One of ordinary skill in the art would have been further motivated to provide a DSP controlled amplitude modulator at the input of the power amplifier so as to amplitude the input signal so as to impart an information content on the signal transmitted as is conventionally known by those of ordinary skill in the art.

Claims like claim 38 recites that the bias level is set to the minimum level necessary to enable operation of the power amplifier. While Bosse and Clar is silent on the exact biasing point the selection of the bias point is merely the selection of the optimum or workable range that involves but routine skill in the art. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to select the bias point to the minimum so as to reduce power consumption, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105, USPQ 233.

With respect to claim 39 here the bias point is controlled with respect to "impedance". It is well known to provide temperature compensation to a bias circuit and a conventional temperature compensation circuit utilizes a control impedance based on temperature. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide a temperature compensation circuit to the bias arrangement of Bosse and Clar so as to control the bias point with respect to an impedance that is responsive to temperature so as to correct for temperature as is conventionally known in the art.

With respect to claim 41-46 here applicant recites use of a Class E power amplifier and the tuning points of the output network to be tuned to optimum or suboptimum tuned. The tuning point is merely part of the optimum or workable range that involves but routine skill in the art. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to tune to optimum or

tune to suboptimum within the workable range, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105, USPQ 233. As to the use of a Class E amplifier, the selection of the class of amplifier results in the selection of the amount a linearity and accordingly the amount of power consumption.. For example a Class A amplifier is "on" all the time thereby drawing power all the time. A switching amplifier is conventionally known to not draw as much power as the amplifying element are switched off a times. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ a Class E amplifier in Bosse and Clar to save power as is conventionally known in the art. Still further a Class E is considered to be an art recognized equivalent to that of Bosse and Clar. Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to replace the power amplifier of Bosse and Clar with a Class E amplifier since the examiner takes Official Notice of the equivalence of the Class E amplifier and the amplifier of Bosse and Clar for their use in the RF electronic art and the selection of any of these known equivalents to provide an amplifier function would be within the level of ordinary skill in the art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael B. Shingleton whose telephone number is (571) 272-1770.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal, can be reached on (571)272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306 and after July 15, 2005 the fax number will be 571-273-8300. Note that old fax number (703-872-9306) will be service until September 15, 2005.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MBS
November 28, 2005

Michael B Shingleton
Primary Examiner
Group Art Unit 2817